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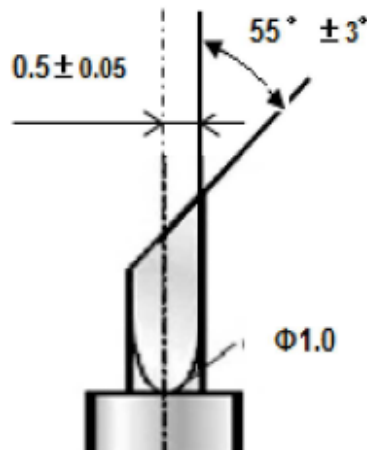
## Summary

This document teaches the basics of cutter blade knowledge and offers suggestions for troubleshooting cutting issues.

## Cutter Blade Design

Below is a summary of the cutter blade design.

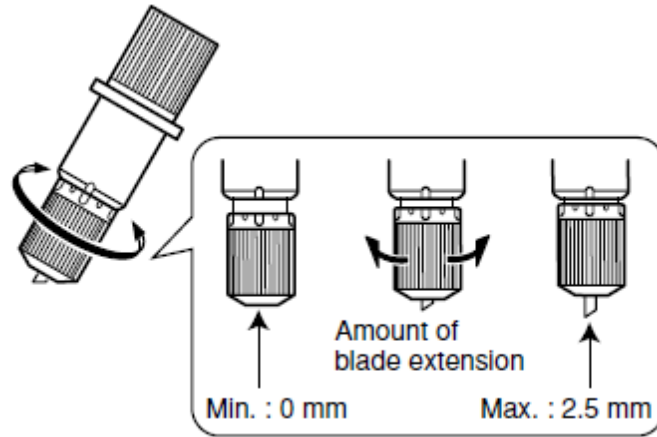
- $0.5 \pm 0.05$  Offset: Distance from the center of the blade to the edge of the blade. The offset determines the blade's turning radius and how it compensates for distance while turning corners. Offset is specified by the blade manufacturer.
- $55^\circ$  Angle: The angle is specified in the measurement of degrees. The blade below is a 55-degree blade.
- $\varnothing 1.0$  Circumference: Lists the circumference of the blade tip.



## Blade Extension - CutContour

Below offers a brief overview of optimal blade extension.

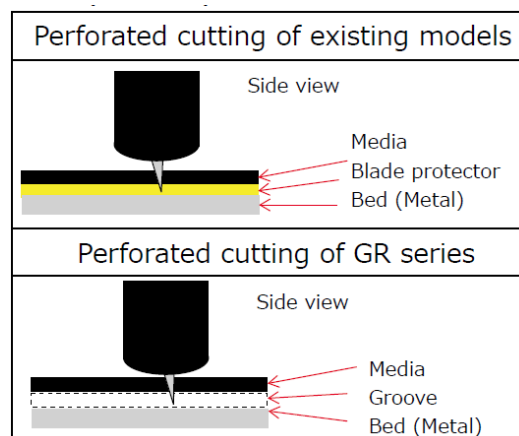
- Blade extension is adjusted by twisting the blade holder's cap.
- Blade extension should be minimized for substrates. The blade is often extended too far.
- A good strategy to start with is to extend the blade the length of half the thickness of a credit card. Then send a cut test to determine if more down force is required and/or if more blade extension is required.



## Blade Extension - PerfCutContour

Below offers a brief overview of optimal blade extension for perforated cutting.

- No Groove in Platen
  - The blade is extended the same length as CutContour cutting for Roland devices that do not have a designated groove for perforated cutting. The reason is the blade makes contact with the blade protection strip and overextending the blade can severely damage the cutter protection strip.
  - This strategy applies to Roland printer/cutters and the CAMM-1 Pro GS-24 and GX-24 models.
- Groove in Platen
  - The blade is extended further for devices with a dedicated groove in the platen for perforated cutting.
  - A good strategy to determine how far to extend the blade is to take the material you are going to percut and fold it over on itself. Then drag the blade holder over the material. The ideal blade extension length is achieved when the first layer of material is cleanly cut (including through the liner) and the second layer is barely scored. If both layers are cut then the blade is extended too far. If the first layer is not cleanly cut then the blade extension length is too little.
  - This strategy applies to the CAMM-1 GR cutter series.



## Blade Settings

Below lists the optimal blade settings by application. These are general guidelines only and it is always recommended to send a cut test before sending any jobs.

Material	Cutting Force	Cutting Speed
Cardboard	250 - 400 gf	≦ 20cm/s
Flock	80 - 160 gf	≦ 20 cm/s
Floor Laminate	100 - 350 gf	≦ 30 cm/s
Heat Transfer	30 - 100 gf	≦ 30 cm/s
Magnetic	150 - 600 gf	≦ 10 cm/s
PerfCut	100 - 300 gf	≦ 30 cm/s
Reflective	100 - 350 gf	≦ 20 cm/s
Sandblast	100 - 500gf	≦ 20cm/s
Twill	80 - 250 gf	≦ 30 cm/s
Vinyl ≤ 3 mil	30 - 100 gf	≦ 30 cm/s
Vinyl ≥ 3mil	100 - 300 gf	≦ 30 cm/s
Window Tint	80 - 120 gf	≦ 25 cm/s

## Troubleshooting

Below summarizes common cutting issues and possible solutions.

### Incomplete Cuts

- Problem: Vinyl is not cut all the way through
- Possible Solutions:
  - The blade is dull or chipped.
  - Improper blade extension.
  - The pressure is not high enough.

### Stitch Cut or Dash Cut

- Problem: Cut lines appear as dashes
- Possible Solutions:
  - The cutter protection strip is damaged and needs to be replaced.
  - The blade is dull or chipped.
  - The speed is set too low.
  - The blade holder needs to be replaced.

### Circles Don't Close

- Problem: Vectors do not connect according to artwork on screen
- Possible Solutions:
  - Replace font with Sans Serif fonts. Serif fonts have sharp angled corners and the blade can't turn fast enough to close the corners.
  - Points need to be rounded. (E.g. vector graphics that have small angles like serif fonts. e.g. -flame tips)
  - Incorrect blade offset.

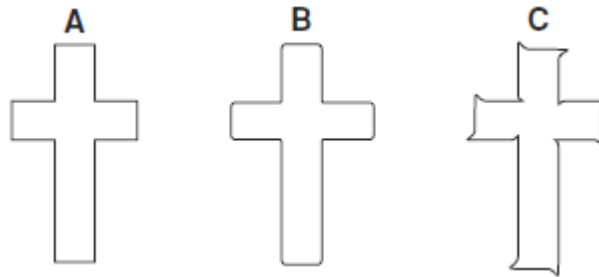
### Small Letters and Shapes Lift Up During Cutting

- Problem: Adhesive gets stuck together while cutting
- Possible Solutions:
  - Use vinyl with a different adhesive because some adhesives don't adhere to the liner well enough for small detail. Removable/low tack adhesives are most common problem.

- Increase blade extension because adhesive may be too thick and is not being cut all the way through.
- Replace blade with a sharper blade to ensure it can cut through the adhesive.
- Use a blade with a higher angle. Low angle blades may not cut through adhesive effectively.
- Increase pen pressure because the liner could be soft and is absorbing the adhesive causing it to gel together.

### Curved Corners

- Problem: Corners don't look right.
- Possible Solutions:
  - The offset is not correct.
    - Image A demonstrates optimal offset.
    - Image B demonstrates not enough offset (curved corners).
    - Image C demonstrates too much offset (flaps on corners).



## Blade SKUs

Below lists the blades available from Roland and which applications the blade is best suited for. Please note, the list of applications is a general guideline only.

### Cemented Carbide Premium Blades

- ZEC-U5032\* 45°/.25 Offset Premium Blade, 2 ea. - Standard Materials
- ZEC-U5025 45°/.25 Offset Premium Blade, 5 ea. - Standard Materials
- ZEC-U1005 45°/.25 Offset Premium Blade, 5 ea. - All Purpose
- ZEC-U3050 60°/.50 Offset Premium Blade, 5 ea. – Sandblast
- ZEC-U3100 60°/1.00 Offset Premium Blade, 5 ea. - Thick Materials

### Tungsten Carbide Standard Blades

- USA-C125-5 25°/.125 Offset Blade, 5 ea. - Thin Materials
- USA-C145-X 45°/.25 Offset Blade, 1 ea. - All Purpose
- USA-C160-X 60°/.10 Offset Blade, 3 ea. - Thick Materials

### Specialty Blades

- USA-RWEAR-5 54°/.50 Offset, 5 ea. - Apparel Blade (Twill)
- ZEC-U5010 55°/.5 Offset Blade, 2 ea. - Window Tint

\*Each new Roland printer/cutter and plotter ships with one ZEC-U5032 blade.

SKU	Angle	Cardboard	Flock	Floor Laminate	Heat Transfer	Magnetic	PerfCut	Reflective	Sandblast	Twill	Vinyl ≤ 3 mil	Vinyl ≥ 3mil	Window Tint
USA-C125-5	45°												•
ZEC-U1005	45°				•						•	•	
USA-C145-X	45°				•						•		
ZEC-U5025	45°				•						•	•	
ZEC-U5032	45°				•						•	•	
USA-RWEAR-5	54°		•							•			
ZEC-U5010	55°												•
ZEC-U3050	60°	•	•	•		•	•	•	•	•		•	
ZEC-U3100	60°	•		•		•	•	•	•				
USA-C160-X	60°	•	•	•		•	•	•	•	•		•	